



- 1/28 -

## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

- (i) APPLICANTS: Petkovich, P. Martin, White, Jay A.,  
Beckett, Barbara R., Jones, Glenville
- (ii) TITLE OF INVENTION: Retinoid Metabolizing Protein
- (iii) NUMBER OF SEQUENCES: 43
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE: Torys LLP
  - (B) STREET: 3000 - 79 Wellington Street West
  - (C) CITY: Toronto
  - (D) STATE: Ontario
  - (E) COUNTRY: Canada
  - (F) ZIP: M5K 1N2
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Diskette, 3 1/2 inch, 1.4 Mb storage
  - (B) COMPUTER: COMPAQ, IBM PC compatible
  - (C) OPERATING SYSTEM: MS-DOS 5.1
  - (D) SOFTWARE: WORD PERFECT
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER: 09/668,482
  - (B) FILING DATE: September 25, 2000
- (vii) PRIOR APPLICATION DATA:
  - (A) APPLICATION NUMBERS: 08/667,546; 08/724,466; PCT/CA97/00440;
  - (B) FILING DATE: June 21, 1996; October 1, 1996; June 23, 1997;
- (viii) ATTORNEY/AGENT INFORMATION:
  - (A) NAME: Hunt, John C.
  - (B) REGISTRATION NUMBER: 36,424
  - (C) REFERENCE/DOCKET NUMBER: 32391-2005
- (ix) TELECOMMUNICATION INFORMATION:
  - (A) TELEPHONE: (416) 865-8121
  - (B) TELEFAX: (416) 865-7380

## (2) INFORMATION FOR SEQ ID NO:1

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 337 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1

TGCCAGTGGG CAATCTCCCT ACCAAATTCA CTAGTTATGT CCAGAAATTA GCCTAAACCG	60
GAGCCTTTGT ACATATGTTT TTATTTTAGA TGAAGTGTGA TGTATTGGAT ATTTTCTAAT	120
TTGTTTATAT AAAGCAGATG TGTATATAAG TCTATGCGAA GAAGCGAAAA CGAGGGCACT	180

- 2/28 -

ACTTCTCAT GGATCACTGT AATGCTACAG AGTGTCTGTG ATGTATATTT ATAATGTAGT 240  
 TGTGTCATAT AGCTTTTGTG CTGTATGCAA CTTATTTAAC TCGCTCTTTA TCTCATGGGT 300  
 TTTATTTAAT AAAACATGTT CTTACAAAAA AAAAAA 337

## (2) INFORMATION FOR SEQ ID NO:2

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 492 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2

Met Gly Leu Tyr Thr Leu Met Val Thr Phe Leu Cys Thr Ile Val Leu  
 1 5 10 15  
 Pro Val Leu Leu Phe Leu Ala Ala Val Lys Leu Trp Glu Met Leu Met  
 20 25 30  
 Ile Arg Arg Val Asp Pro Asn Cys Arg Ser Pro Leu Pro Pro Gly Thr  
 35 40 45  
 Met Gly Leu Pro Phe Ile Gly Glu Thr Leu Gln Leu Ile Leu Gln Arg  
 50 55 60  
 Arg Lys Phe Leu Arg Met Lys Arg Gln Lys Tyr Gly Cys Ile Tyr Lys  
 65 70 75 80  
 Thr His Leu Phe Gly Asn Pro Thr Val Arg Val Met Gly Ala Asp Asn  
 85 90 95  
 Val Arg Gln Ile Leu Leu Gly Glu His Lys Leu Val Ser Val Gln Trp  
 100 105 110  
 Pro Ala Ser Val Arg Thr Ile Leu Gly Ser Asp Thr Leu Ser Asn Val  
 115 120 125  
 His Gly Val Gln His Lys Asn Lys Lys Lys Ala Ile Met Arg Ala Phe  
 130 135 140  
 Ser Arg Asp Ala Leu Glu His Tyr Ile Pro Val Ile Gln Gln Glu Val  
 145 150 155 160  
 Lys Ser Ala Ile Gln Glu Trp Leu Gln Lys Asp Ser Cys Val Leu Val  
 165 170 175  
 Tyr Pro Glu Met Lys Lys Leu Met Phe Arg Ile Ala Met Arg Ile Leu  
 180 185 190  
 Leu Gly Phe Glu Pro Glu Gln Ile Lys Thr Asp Glu Gln Glu Leu Val  
 195 200 205

- 3/28 -

Glu Ala Phe Glu Glu Met Ile Lys Asn Leu Phe Ser Leu Pro Ile Asp  
 210 215 220  
 Val Pro Phe Ser Gly Leu Tyr Arg Gly Leu Arg Ala Arg Asn Phe Ile  
 225 230 235 240  
 His Ser Lys Ile Glu Glu Asn Ile Arg Lys Lys Ile Gln Asp Asp Asp  
 245 250 255  
 Asn Glu Asn Glu Gln Lys Tyr Lys Asp Ala Leu Gln Leu Leu Ile Glu  
 260 265 270  
 Asn Ser Arg Arg Ser Asp Glu Pro Phe Ser Leu Gln Ala Met Lys Glu  
 275 280 285  
 Ala Ala Thr Glu Leu Leu Phe Gly Gly His Glu Thr Thr Ala Ser Thr  
 290 295 300  
 Ala Thr Ser Leu Val Met Phe Leu Gly Leu Asn Thr Glu Val Val Gln  
 305 310 315 320  
 Lys Val Arg Glu Glu Val Gln Glu Lys Val Glu Met Gly Met Tyr Thr  
 325 330 335  
 Pro Gly Lys Gly Leu Ser Met Glu Leu Leu Asp Gln Leu Lys Tyr Thr  
 340 345 350  
 Gly Cys Val Ile Lys Glu Thr Leu Arg Ile Asn Pro Pro Val Pro Gly  
 355 360 365  
 Gly Phe Arg Val Ala Leu Lys Thr Phe Glu Leu Asn Gly Tyr Gln Ile  
 370 375 380  
 Pro Lys Gly Trp Asn Val Ile Tyr Ser Ile Cys Asp Thr His Asp Val  
 385 390 395 400  
 Ala Asp Val Phe Pro Asn Lys Glu Glu Phe Gln Pro Glu Arg Phe Met  
 405 410 415  
 Ser Lys Gly Leu Glu Asp Gly Ser Arg Phe Asn Tyr Ile Pro Phe Gly  
 420 425 430  
 Gly Gly Ser Arg Met Cys Val Gly Lys Glu Phe Ala Lys Val Leu Leu  
 435 440 445  
 Lys Ile Phe Leu Val Glu Leu Thr Gln His Cys Asn Trp Ile Leu Ser  
 450 455 460  
 Asn Gly Pro Pro Thr Met Lys Thr Gly Pro Thr Ile Tyr Pro Val Asp  
 465 470 475 480  
 Asn Leu Pro Thr Lys Phe Thr Ser Tyr Val Arg Asn  
 485 490

- 4/28 -

## (2) INFORMATION FOR SEQ ID NO:3

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1850 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3

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TGTCGCCGTT GCTGTCGGTT GCTGTCGGAC GCTGTCTCCT CTCCAGAAGC TTGTTTTTCG      60
TTTTGGCGAT CAGTTGCGCG CTTC AAC ATG GGG CTG TAC ACC CTT ATG GTC ACC      114
                               Met Gly Leu Tyr Thr Leu Met Val Thr
                               1           5

TTT CTC TGC ACC ATC GTG CTA CCC GTT TTA CTC TTT CTC GCC GCG GTG      162
Phe Leu Cys Thr Ile Val Leu Pro Val Leu Leu Phe Leu Ala Ala Val
10           15           20           25

AAG TTG TGG GAG ATG TTA ATG ATC CGA CGA GTC GAT CCG AAC TGC AGA      210
Lys Leu Trp Glu Met Leu Met Ile Arg Arg Val Asp Pro Asn Cys Arg
           30           35           40

AGT CCT CTA CCG CCA GGT ACC ATG GGC TTG CCG TTC ATT GGA GAA ACG      258
Ser Pro Leu Pro Pro Gly Thr Met Gly Leu Pro Phe Ile Gly Glu Thr
           45           50           55

CTC CAG CTG ATC CTC CAG AGA AGG AAG TTT CTG CGC ATG AAA CGG CAG      306
Leu Gln Leu Ile Leu Gln Arg Arg Lys Phe Leu Arg Met Lys Arg Gln
           60           65           70

AAA TAC GGG TGC ATC TAC AAG ACG CAC CTC TTC GGG AAC CCG ACT GTC      354
Lys Tyr Gly Cys Ile Tyr Lys Thr His Leu Phe Gly Asn Pro Thr Val
           75           80           85

AGG GTG ATG GGA GCT GAT AAT GTG AGG CAG ATT CTG CTG GGC GAA CAC      402
Arg Val Met Gly Ala Asp Asn Val Arg Gln Ile Leu Leu Gly Glu His
           90           95           100           105

AAG CTG GTG TCT GTT CAG TGG CCA GCA TCA GTG AGA ACC ATC CTG GGC      450
Lys Leu Val Ser Val Gln Trp Pro Ala Ser Val Arg Thr Ile Leu Gly
           110           115           120

TCT GAC ACC CTC TCC AAT GTC CAT GGA GTT CAA CAC AAA AAC AAG AAA      498
Ser Asp Thr Leu Ser Asn Val His Gly Val Gln His Lys Asn Lys Lys
           125           130           135

AAG GCC ATT ATG AGG GCG TTC TCT CGA GAT GCT CTG GAG CAC TAC ATT      546
Lys Ala Ile Met Arg Ala Phe Ser Arg Asp Ala Leu Glu His Tyr Ile
           140           145           150

CCC GTG ATC CAG CAG GAG GTG AAG AGC GCC ATA CAG GAA TGG CTG CAA      594
Pro Val Ile Gln Gln Glu Val Lys Ser Ala Ile Gln Glu Trp Leu Gln
           155           160           165

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- 5/28 -

AAA GAC TCC TGC GTG CTG GTT TAT CCA GAA ATG AAG AAA CTC ATG TTT Lys Asp Ser Cys Val Leu Val Tyr Pro Glu Met Lys Lys Leu Met Phe 170 175 180 185	642
CGG ATA GCT ATG AGA ATC CTG CTT GGT TTT GAA CCA GAG CAA ATA AAG Arg Ile Ala Met Arg Ile Leu Leu Gly Phe Glu Pro Glu Gln Ile Lys 190 195 200	690
ACG GAC GAG CAA GAA CTG GTG GAA GCT TTT GAG GAA ATG ATC AAA AAC Thr Asp Glu Gln Glu Leu Val Glu Ala Phe Glu Glu Met Ile Lys Asn 205 210 215	738
TTG TTC TCC TTG CCA ATC GAC GTT CCT TTC AGT GGT CTG TAC AGG GGT Leu Phe Ser Leu Pro Ile Asp Val Pro Phe Ser Gly Leu Tyr Arg Gly 220 225 230	786
TTG AGG GCA CGC AAT TTC ATT CAC TCC AAA ATT GAG GAA AAC ATC AGG Leu Arg Ala Arg Asn Phe Ile His Ser Lys Ile Glu Glu Asn Ile Arg 235 240 245	834
AAG AAA ATT CAA GAT GAC GAC AAT GAA AAC GAA CAG AAA TAC AAA GAC Lys Lys Ile Gln Asp Asp Asp Asn Glu Asn Glu gln Lys Tyr Lys Asp 250 255 260 265	882
GCC CTT CAG CTG TTG ATC GAG AAC AGC AGA AGA AGT GAC GAA CCT TTT Ala Leu Gln Leu Leu Ile Glu Asn Ser Arg Arg Ser Asp Glu Pro Phe 270 275 280	930
AGT TTG CAG GCG ATG AAA GAA GCA GCT ACA GAG CTT CTA TTT GGA GGT Ser Leu Gln Ala Met Lys Glu Ala Ala Thr Glu Leu Leu Phe Gly Gly 285 290 295	978
CAT GAA ACC ACC GCC AGC ACT GCA ACC TCA CTT GTC ATG TTT CTG GGT His Glu Thr Thr Ala Ser Thr Ala Thr Ser Leu Val Met Phe Leu Gly 300 305 310	1026
CTG AAC ACA GAA GTG GTG CAG AAG GTC AGA GAG GAG GTT CAG GAG AAG Leu Asn Thr Glu Val Val Gln Lys Val Arg Glu Glu Val Gln Glu Lys 315 320 325	1074
GTT GAA ATG GGC ATG TAT ACA CCT GGA AAG GGC TTG AGT ATG GAG CTG Val Glu Met Gly Met Tyr Thr Pro Gly Lys Gly Leu Ser Met Glu Leu 330 335 340 345	1122
TTG GAC CAG CTG AAG TAC ACT GGA TGT GTG ATT AAA GAG ACT CTT AGA Leu Asp Gln Leu Lys Tyr Thr Gly Cys Val Ile Lys Glu Thr Leu Arg 350 355 360	1170
ATC AAC CCT CCT GTT CCC GGA GGA TTC AGA GTC GCA CTC AAA ACC TTT Ile Asn Pro Pro Val Pro Gly Gly Phe Arg Val Ala Leu Lys Thr Phe 365 370 375	1218
GAA TTG AAT GGT TAC CAA ATT CCT AAA GGA TGG AAC GTC ATT TAC AGC Glu Leu Asn Gly Tyr Gln Ile Pro Lys Gly Trp Asn Val Ile Tyr Ser 380 385 390	1266

- 6/28 -

ATC TGT GAC ACG CAC GAT GTG GCC GAC GTC TTT CCA AAC AAA GAG GAG Ile Cys Asp Thr His Asp Val Ala Asp Val Phe Pro Asn Lys Glu Glu 395 400 405	1314
TTC CAG CCG GAG AGA TTC ATG AGC AAA GGT CTG GAG GAC GGG TCC AGG Phe Gln Pro Glu Arg Phe Met Ser Lys Gly Leu Glu Asp Gly Ser Arg 410 415 420 425	1362
TTT AAC TAC ATC CCC TTC GGA GGA GGA TCC AGG ATG TGT GTG GGC AAA Phe Asn Tyr Ile Pro Phe Gly Gly Gly Ser Arg Met Cys Val Gly Lys 430 435 440	1410
GAG TTC GCC AAA GTG TTA CTC AAG ATC TTT TTA GTT GAG TTA ACG CAG Glu Phe Ala Lys Val Leu Leu Lys Ile Phe Leu Val Glu Leu Thr Gln 445 450 455	1458
CAT TGC AAT TGG ATT CTC TCA AAC GGA CCC CCG ACA ATG AAA ACA GGC His Cys Asn Trp Ile Leu Ser Asn Gly Pro Pro Thr Met Lys Thr Gly 460 465 470	1506
CCG ACT ATT TAC CCA GTG GAC AAT CTC CCT ACC AAA TTC ACT AGT TAT Pro Thr Ile Tyr Pro Val Asp Asn Leu Pro Thr Lys Phe Thr Ser Tyr 475 480 485	1554
GTC AGA AAT TAGCCTAACC GGAGCTTTGT ACATATGTTT TTATTTTAGA Val Arg Asn 490	1603
TGAACTGTGA TGTATTGGAT ATTTTCTATT TTGTTTATAT AAAGCAGATG TGTATATAAG	1663
TCTATGCGAG GAAGCGAAAA CGAGGGCACT ACTTTCTCAT GGATCACTGT AATGCTACAG	1723
AGTGTCTGTG ATGTATATTT ATAATGTAGT TGTGTTATAT AGCTTTTGTA CTGTATGCAA	1783
CTTATTTAAC TCGCTCTTTA TCTCATGGGT TTTATTTAAT AAAACATGTT CTTACAAAAA	1843
AAAAAAA	1850

## (2) INFORMATION FOR SEQ ID NO:4

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 497 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4

Met Gly Leu Pro Ala Leu Leu Ala Ser Ala Leu Cys Thr Phe Val Leu 1 5 10 15
Pro Leu Leu Leu Phe Leu Ala Ala Ile Lys Leu Trp Asp Leu Tyr Cys 20 25 30
Val Ser Gly Arg Asp Arg Ser Cys Ala Leu Pro Leu Pro Pro Gly Thr 35 40 45

- 7/28 -

Met Gly Phe Pro Phe Phe Gly Glu Thr Leu Gln Met Val Leu Gln Arg  
50 55 60

Arg Lys Phe Leu Gln Met Lys Arg Arg Lys Tyr Gly Phe Ile Tyr Lys  
65 70 75 80

Thr His Leu Phe Gly Arg Pro Thr Val Arg Val Met Gly Ala Asp Asn  
85 90 95

Val Arg Arg Ile Leu Leu Gly Asp Asp Arg Leu Val Ser Val His Trp  
100 105 110

Pro Ala Ser Val Arg Thr Ile Leu Gly Ser Gly Cys Leu Ser Asn Leu  
115 120 125

His Asp Ser Ser His Lys Gln Arg Lys Lys Val Ile Met Arg Ala Phe  
130 135 140

Ser Arg Glu Ala Leu Glu Cys Tyr Val Pro Val Ile Thr Glu Glu Val  
145 150 155 160

Gly Ser Ser Leu Glu Gln Trp Leu Ser Cys Gly Glu Arg Gly Leu Leu  
165 170 175

Val Tyr Pro Glu Val Lys Arg Leu Met Phe Arg Ile Ala Met Arg Ile  
180 185 190

Leu Leu Gly Cys Glu Pro Gln Leu Ala Gly Asp Gly Asp Ser Glu Gln  
195 200 205

Gln Leu Val Glu Ala Phe Glu Glu Met Thr Arg Asn Leu Phe Ser Leu  
210 215 220

Pro Ile Asp Val Pro Phe Ser Gly Leu Tyr Arg Gly Met Lys Ala Arg  
225 230 235 240

Asn Leu Ile His Ala Arg Ile Glu Gln Asn Ile Arg Ala Lys Ile Cys  
245 250 255

Gly Leu Arg Ala Ser Glu Ala Gly Gln Gly Cys Lys Asp Ala Leu Gln  
260 265 270

Leu Leu Ile Glu His Ser Trp Glu Arg Gly Glu Arg Leu Asp Met Gln  
275 280 285

Ala Leu Lys Gln Ser Ser Thr Glu Leu Leu Phe Gly Gly His Glu Thr  
290 295 300

Thr Ala Ser Ala Ala Thr Ser Leu Ile Thr Tyr Leu Gly Leu Tyr Pro  
305 310 315 320

His Val Leu Gln Lys Val Arg Glu Glu Leu Lys Ser Lys Gly Leu Leu  
325 330 335

Cys Lys Ser Asn Gln Asp Asn Lys Leu Asp Met Glu Ile Leu Glu Gln  
340 345 350

- 8/28 -

Leu Lys Tyr Ile Gly Cys Val Ile Lys Glu Thr Leu Arg Leu Asn Pro  
 355 360 365  
 Pro Val Pro Gly Gly Phe Arg Val Ala Leu Lys Thr Phe Glu Leu Asn  
 370 375 380  
 Gly Tyr Gln Ile Pro Lys Gly Trp Asn Val Ile Tyr Ser Ile Cys Asp  
 385 390 395 400  
 Thr His Asp Val Ala Glu Ile Phe Thr Asn Lys Glu Glu Phe Asn Pro  
 405 410 415  
 Asp Arg Phe Ser Ala Pro His Pro Glu Asp Ala Ser Arg Phe Ser Phe  
 420 425 430  
 Ile Pro Phe Gly Gly Gly Leu Arg Ser Cys Val Gly Lys Glu Phe Ala  
 435 440 445  
 Lys Ile Leu Leu Lys Ile Phe Thr Val Glu Leu Ala Arg His Cys Asp  
 450 455 460  
 Trp Gln Leu Leu Asn Gly Pro Pro Thr Met Lys Thr Ser Pro Thr Val  
 465 470 475 480  
 Tyr Pro Val Asp Asn Leu Pro Ala Arg Phe Thr His Phe His Gly Glu  
 485 490 495  
 Ile

## (2) INFORMATION FOR SEQ ID NO:5

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1494 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5

ATG GGG CTC CCG GCG CTG CTG GCC AGT GCG CTC TGC ACC TTC GTG CTG	48
Met Gly Leu Pro Ala Leu Leu Ala Ser Ala Leu Cys Thr Phe Val Leu	
1 5 10 15	
CCG CTG CTG CTC TTC CTG GCT GCG ATC AAG CTC TGG GAC CTG TAC TGC	96
Pro Leu Leu Phe Leu Ala Ala Ile Lys Leu Trp Asp Leu Tyr Cys	
20 25 30	
GTG AGC GGC CGC GAC CGC AGT TGT GCC CTC CCA TTG CCC CCC GGG ACT	144
Val Ser Gly Arg Asp Arg Ser Cys Ala Leu Pro Leu Pro Pro Gly Thr	
35 40 45	
ATG GGC TTC CCC TTC TTT GGG GAA ACC TTG CAG ATG GTA CTG CAG CGG	192
Met Gly Phe Pro Phe Phe Gly Glu Thr Leu Gln Met Val Leu Gln Arg	
50 55 60	

- 9/28 -

AGG AAG TTC CTG CAG ATG AAG CGC AGG AAA TAC GGC TTC ATC TAC AAG Arg Lys Phe Leu Gln Met Lys Arg Arg Lys Tyr Gly Phe Ile Tyr Lys 65 70 75 80	240
ACG CAT CTG TTC GGG CGG CCC ACC GTA CGG GTG ATG GGC GCG GAC AAT Thr His Leu Phe Gly Arg Pro Thr Val Arg Val Met Gly Ala Asp Asn 85 90 95	288
GTG CGG CGC ATC TTG CTC GGA GAC GAC CGG CTG GTG TCG GTC CAC TGG Val Arg Arg Ile Leu Leu Gly Asp Asp Arg Leu Val Ser Val His Trp 100 105 110	336
CCA GCG TCG GTG CGC ACC ATT CTG GGA TCT GGC TGC CTC TCT AAC CTG Pro Ala Ser Val Arg Thr Ile Leu Gly Ser Gly Cys Leu Ser Asn Leu 115 120 125	384
CAC GAC TCC TCG CAC AAG CAG CGC AAG AAG GTG ATT ATG CGG GCC TTC His Asp Ser Ser His Lys Gln Arg Lys Lys Val Ile Met Arg Ala Phe 130 135 140	432
AGC CGC GAG GCA CTC GAA TGC TAC GTG CCG GTG ATC ACC GAG GAA GTG Ser Arg Glu Ala Leu Glu Cys Tyr Val Pro Val Ile Thr Glu Glu Val 145 150 155 160	480
GGC AGC AGC CTG GAG CAG TGG CTG AGC TGC GGC GAG GGC GGC CTC CTG Gly Ser Ser Leu Glu Gln Trp Leu Ser Cys Gly Glu Arg Gly Leu Leu 165 170 175	528
GTC TAC CCC GAG GTG AAG CGC CTC ATG TTC CGA ATC GCC ATG CGC ATC Val Tyr Pro Glu Val Lys Arg Leu Met Phe Arg Ile Ala Met Arg Ile 180 185 190	576
CTA CTG GGC TGC GAA CCC CAA CTG GCG GGC GAC GGG GAC TCC GAG CAG Leu Leu Gly Cys Glu Pro Gln Leu Ala Gly Asp Gly Asp Ser Glu Gln 195 200 205	624
CAG CTT GTG GAG GCC TTC GAG GAA ATG ACC CGC AAT CTC TTC TCG CTG Gln Leu Val Glu Ala Phe Glu Glu Met Thr Arg Asn Leu Phe Ser Leu 210 215 220	672
CCC ATC GAC GTG CCC TTC AGC GGG CTG TAC CGG GGC ATG AAG GCG CGG Pro Ile Asp Val Pro Phe Ser Gly Leu Tyr Arg Gly Met Lys Ala Arg 225 230 235 240	720
AAC CTC ATT CAC GCG CGC ATC GAG CAG AAC ATT CGC GCC AAG ATC TGC Asn Leu Ile His Ala Arg Ile Glu Gln Asn Ile Arg Ala Lys Ile Cys 245 250 255	768
GGG CTG CGG GCA TCC GAG GCG GGC CAG GGC TGC AAA GAC GCG CTG CAG Gly Leu Arg Ala Ser Glu Ala Gly Gln Gly Cys Lys Asp Ala Leu Gln 260 265 270	816
CTG TTG ATC GAG CAC TCG TGG GAG AGG GGA GAG CGG CTG GAC ATG CAG Leu Leu Ile Glu His Ser Trp Glu Arg Gly Glu Arg Leu Asp Met Gln 275 280 285	864

- 10/28 -

GCA CTA AAG CAA TCT TCA ACC GAA CTC CTC TTT GGA GGA CAC GAA ACC Ala Leu Lys Gln Ser Ser Thr Glu Leu Leu Phe Gly Gly His Glu Thr 290 295 300	912
ACG GCC AGT GCA GCC ACA TCT CTG ATC ACT TAC CTG GGG CTC TAC CCA Thr Ala Ser Ala Ala Thr Ser Leu Ile Thr Tyr Leu Gly Leu Tyr Pro 305 310 315 320	960
CAT GTT CTC CAG AAA GTG CGA GAA GAG CTG AAG AGT AAG GGT TTA CTT His Val Leu Gln Lys Val Arg Glu Glu Leu Lys Ser Lys Gly Leu Leu 325 330 335	1008
TGC AAG AGC AAT CAA GAC AAC AAG TTG GAC ATG GAA ATT TTG GAA CAA Cys Lys Ser Asn Gln Asp Asn Lys Leu Asp Met Glu Ile Leu Glu Gln 340 345 350	1056
CTT AAA TAC ATC GGG TGT GTT ATT AAG GAG ACC CTT CGA CTG AAT CCC Leu Lys Tyr Ile Gly Cys Val Ile Lys Glu Thr Leu Arg Leu Asn Pro 355 360 365	1104
CCA GTT CCA GGA GGG TTT CGG GTT GCT CTG AAG ACT TTT GAA TTA AAT Pro Val Pro Gly Gly Phe Arg Val Ala Leu Lys Thr Phe Glu Leu Asn 370 375 380	1152
GGA TAC CAG ATT CCC AAG GGC TGG AAT GTT ATC TAC AGT ATC TGT GAT Gly Tyr Gln Ile Pro Lys Gly Trp Asn Val Ile Tyr Ser Ile Cys Asp 385 390 395 400	1200
ACT CAT GAT GTG GCA GAG ATC TTC ACC AAC AAG GAA GAA TTT AAT CCT Thr His Asp Val Ala Glu Ile Phe Thr Asn Lys Glu Glu Phe Asn Pro 405 410 415	1248
GAC CGA TTC AGT GCT CCT CAC CCA GAG GAT GCA TCC AGG TTC AGC TTC Asp Arg Phe Ser Ala Pro His Pro Glu Asp Ala Ser Arg Phe Ser Phe 420 425 430	1296
ATT CCA TTT GGA GGA GGC CTT AGG AGC TGT GTA GGC AAA GAA TTT GCA Ile Pro Phe Gly Gly Gly Leu Arg Ser Cys Val Gly Lys Glu Phe Ala 435 440 445	1344
AAA ATT CTT CTC AAA ATA TTT ACA GTG GAG CTG GCC AGG CAT TGT GAC Lys Ile Leu Leu Lys Ile Phe Thr Val Glu Leu Ala Arg His Cys Asp 450 455 460	1392
TGG CAG CTT CTA AAT GGA CCT CCT ACA ATG AAA ACC AGT CCC ACC GTG Trp Gln Leu Leu Asn Gly Pro Pro Thr Met Lys Thr Ser Pro Thr Val 465 470 475 480	1440
TAT CCT GTG GAC AAT CTC CCT GCA AGA TTC ACC CAT TTC CAT GGG GAA Tyr Pro Val Asp Asn Leu Pro Ala Arg Phe Thr His Phe His Gly Glu 485 490 495	1488
ATC TGA Ile	1494

- 11/28 -

## (2) INFORMATION FOR SEQ ID NO:6

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6

Pro Phe Gly Gly Gly Pro Arg Leu Cys Pro Gly Tyr Glu Leu Ala Arg  
1 5 10 15  
Val Ala Leu Ser  
20

## (2) INFORMATION FOR SEQ ID NO:7

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7

Pro Phe Ser Gly Gly Ala Arg Asn Cys Ile Gly Lys Gln Phe Ala Met  
1 5 10 15  
Ser Glu Met Lys  
20

## (2) INFORMATION FOR SEQ ID NO:8

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8

Pro Phe Ser Gly Gly Ala Arg Asn Cys Ile Gly Lys Gln Phe Ala Met  
1 5 10 15  
Asn Glu Leu Lys  
20

## (2) INFORMATION FOR SEQ ID NO:9

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

- 12/28 -

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9

Pro Phe Gly Thr Gly Pro Arg Asn Cys Ile Gly Met Arg Phe Ala Ile  
 1 5 10 15  
 Met Asn Met Lys  
 20

## (2) INFORMATION FOR SEQ ID NO:10

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 20 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10

Pro Phe Ser Gly Gly Ser Arg Asn Cys Ile Gly Lys Gln Phe Ala Met  
 1 5 10 15  
 Asn Glu Leu Lys  
 20

## (2) INFORMATION FOR SEQ ID NO:11

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 351 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11

GAAGTCCTCT TTGGAGGACA CGAAACCACG GCCAGTGCAG CCACATCTCT GATCACTTAC 60  
 CTGGGGCTCT ACCCACATGT TCTCCAGAAA GTGCGAGAAG AGCTGAAGAG TAAGGGTTTA 120  
 CTTTGCAAGA GCAATCAAGA CAACAAGTTG GACATGGAAA TTTTGGAACA ACTTAAATAC 180  
 ATCGGGTGTG TTATTAAGGA GACCCTTCGA CTGAATCCCC CAGTTCAGG AGGGTTTCGG 240  
 GTTGCTCTGA AGACTTTTGA ATTAAATGGA TACCAGATTC CCAAGGGCTG GAATGTTATC 300  
 TACAGTATCT GTGATACTCA TGATGTGGCA GAGATCTTCA CCAACAAGGA A 351

## (2) INFORMATION FOR SEQ ID NO:12

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 14 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12

TTTTTTTTTT TTGG 14

- 13/28 -

- (2) INFORMATION FOR SEQ ID NO:13  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13

TTTTTTTTTT TTGA

14

- (2) INFORMATION FOR SEQ ID NO:14  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14

TTTTTTTTTT TTGT

14

- (2) INFORMATION FOR SEQ ID NO:15  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15

TTTTTTTTTT TTGC

14

- (2) INFORMATION FOR SEQ ID NO:16  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16

TTTTTTTTTT TTAG

14

- (2) INFORMATION FOR SEQ ID NO:17  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

- 14/28 -

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17

TTTTTTTTTT TTAA

14

(2) INFORMATION FOR SEQ ID NO:18

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18

TTTTTTTTTT TTAT

14

(2) INFORMATION FOR SEQ ID NO:19

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19

TTTTTTTTTT TTAC

14

(2) INFORMATION FOR SEQ ID NO:20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20

TTTTTTTTTT TTGC

14

(2) INFORMATION FOR SEQ ID NO:21

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21

TTTTTTTTTT TTCA

14

- 15/28 -

- (2) INFORMATION FOR SEQ ID NO:22  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22

TTTTTTTTTT TTCT

14

- (2) INFORMATION FOR SEQ ID NO:23  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23

TTTTTTTTTT TTCC

14

- (2) INFORMATION FOR SEQ ID NO:24  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24

AAGCGACCGA

10

- (2) INFORMATION FOR SEQ ID NO:25  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25

TGTTGCCAG

10

- (2) INFORMATION FOR SEQ ID NO:26  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

- 16/28 -

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26

TGCCAGTGGGA

10

(2) INFORMATION FOR SEQ ID NO:27

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27

GGCTGCAAAC

10

(2) INFORMATION FOR SEQ ID NO:28

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28

CCTAGCGTTG

10

(2) INFORMATION FOR SEQ ID NO:29

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29

GTAGCGGCCG CTGCCAGTGG A

21

(2) INFORMATION FOR SEQ ID NO:30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30

GTAGCGGCCG CT

12

- 17/28 -

## (2) INFORMATION FOR SEQ ID NO:31

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1725 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31

```

GCACGAGGGA GGCTGAAGCG TGCC ATG GGG CTC CCG GCG CTG CTG GCC AGT      51
                Met Gly Leu Pro Ala Leu Leu Ala Ser
                1                5

GCG CTC TGC ACC TTC GTG CTG CCG CTG CTG CTC TTC CTG GCG GCG CTC      99
Ala Leu Cys Thr Phe Val Leu Pro Leu Leu Leu Phe Leu Ala Ala Leu
10                15                20                25

AAG CTC TGG GAC CTG TAC TGT GTG AGC AGC CGC GAT CGC AGC TGC GCC      147
Lys Leu Trp Asp Leu Tyr Cys Val Ser Ser Arg Asp Arg Ser Cys Ala
                30                35                40

CTC CCC TTG CCC CCC GGT ACC ATG GGC TTC CCA TTC TTT GGG GAA ACA      195
Leu Pro Leu Pro Pro Gly Thr Met Gly Phe Pro Phe Phe Gly Glu Thr
                45                50                55

TTG CAG ATG GTG CTT CAG CGG AGG AAG TTT CTG CAG ATG AAG CGC AGG      243
Leu Gln Met Val Leu Gln Arg Arg Lys Phe Leu Gln Met Lys Arg Arg
                60                65                70

AAA TAC GGC TTC ATC TAC AAG ACG CAT CTG TTT GGG CGG CCC ACG GTG      291
Lys Tyr Gly Phe Ile Tyr Lys Thr His Leu Phe Gly Arg Pro Thr Val
                75                80                85

CGG GTG ATG GGC GCG GAT AAT GTG CGG CGC ATC TTG CTG GGA GAG CAC      339
Arg Val Met Gly Ala Asp Asn Val Arg Arg Ile Leu Leu Gly Glu His
                90                95                100                105

CGG TTG GTG TCG GTG CAC TGG CCC GCG TCG GTG CGC ACC ATC CTG GGC      387
Arg Leu Val Ser Val His Trp Pro Ala Ser Val Arg Thr Ile Leu Gly
                110                115                120

GCT GGC TGC CTC TCC AAC CTG CAC GAT TCC TCG CAC AAG CAG CGA AAG      435
Ala Gly Cys Leu Ser Asn Leu His Asp Ser Ser His Lys Gln Arg Lys
                125                130                135

AAG GTG ATT ATG CAG GCC TTC AGC CGC GAG GCA CTC CAG TGC TAC GTG      483
Lys Val Ile Met Gln Ala Phe Ser Arg Glu Ala Leu Gln Cys Tyr Val
                140                145                150

CTC GTG ATC GCT GAG GAA GTC AGC AGT TGT CTG GAG CAG TGG CTA AGC      531
Leu Val Ile Ala Glu Glu Val Ser Ser Cys Leu Glu Gln Trp Leu Ser
                155                160                165

TGC GGC GAG CGC GGC CTC CTG GTC TAC CCC GAG GTG AAG CGC CTC ATG      579
Cys Gly Glu Arg Gly Leu Leu Val Tyr Pro Glu Val Lys Arg Leu Met
                170                175                180                185

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- 18/28 -

TTC CGC ATC GCC ATG CGC ATC CTG CTG GGC TGC GAG CCG GGT CCA GCG Phe Arg Ile Ala Met Arg Ile Leu Leu Gly Cys Glu Pro Gly Pro Ala 190 195 200	627
GGC GGC GGG GAG GAC GAG CAA CAG CTC GTG GAG GCT TTC GAG GAG ATG Gly Gly Gly Glu Asp Glu Gln Gln Leu Val Glu Ala Phe Glu Glu Met 205 210 215	675
ACC CGC AAT CTC TTC TCT CTT CCC ATT GAC GTG CCC TTT AGC GGC CTG Thr Arg Asn Leu Phe Ser Leu Pro Ile Asp Val Pro Phe Ser Gly Leu 220 225 230	723
TAC CGG GGC GTG AAG GCG CGG AAC CTT ATA CAC GCG CGC ATC GAG GAG Tyr Arg Gly Val Lys Ala Arg Asn Leu Ile His Ala Arg Ile Glu Glu 235 240 245	771
AAC ATT CGC GCC AAG ATC CGC CGG CTT CAG GCT ACA GAG CCG GAT GGG Asn Ile Arg Ala Lys Ile Arg Arg Leu Gln Ala Thr Glu Pro Asp Gly 250 255 260 265	819
GGT TGC AAG GAC GCG CTG CAG CTC CTG ATT GAG CAC TCG TGG GAG AGG Gly Cys Lys Asp Ala Leu Gln Leu Leu Ile Glu His Ser Trp Glu Arg 270 275 280	867
GGA GAG AGG CTG GAT ATG CAG GCA CTA AAA CAA TCG TCA ACA GAG CTC Gly Glu Arg Leu Asp Met Gln Ala Leu Lys Gln Ser Ser Thr Glu Leu 285 290 295	915
CTC TTT GGT GGT CAT GAA ACT ACA GCC AGT GCT GCG ACA TCA CTG ATC Leu Phe Gly Gly His Glu Thr Thr Ala Ser Ala Ala Thr Ser Leu Ile 300 305 310	963
ACT TAC CTA GGA CTC TAC CCA CAT GTC CTC CAG AAA GTT CGA GAA GAG Thr Tyr Leu Gly Leu Tyr Pro His Val Leu Gln Lys Val Arg Glu Glu 315 320 325	1011
ATA AAG AGC AAG GGC TTA CTT TGC AAG AGC AAT CAA GAC AAC AAG TTA Ile Lys Ser Lys Gly Leu Leu Cys Lys Ser Asn Gln Asp Asn Lys Leu 330 335 340 345	1059
GAC ATG GAA ACT TTG GAA CAG CTT AAA TAC ATT GGG TGT GTC ATT AAG Asp Met Glu Thr Leu Glu Gln Leu Lys Tyr Ile Gly Cys Val Ile Lys 350 355 360	1107
GAG ACC CTG CGA TTG AAT CCT CCG GTT CCA GGA GGG TTT CGG GTT GCT Glu Thr Leu Arg Leu Asn Pro Pro Val Pro Gly Gly Phe Arg Val Ala 365 370 375	1155
CTG AAG ACT TTT GAG CTG AAT GGA TAC CAG ATC CCC AAG GGC TGG AAT Leu Lys Thr Phe Glu Leu Asn Gly Tyr Gln Ile Pro Lys Gly Trp Asn 380 385 390	1203
GTT ATT TAC AGT ATC TGT GAC ACC CAC GAT GTG GCA GAT ATC TTC ACT Val Ile Tyr Ser Ile Cys Asp Thr His Asp Val Ala Asp Ile Phe Thr 395 400 405	1251

- 19/28 -

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AAC AAG GAG GAA TTT AAT CCC GAC CGC TTT ATA GTG CCT CAT CCA GAG      1299
Asn Lys Glu Glu Phe Asn Pro Asp Arg Phe Ile Val Pro His Pro Glu
410                      415                      420                      425

GAT GCT TCC CGG TTC AGC TTC ATT CCA TTT GGA GGA GGC CTT CGG AGC      1347
Asp Ala Ser Arg Phe Ser Phe Ile Pro Phe Gly Gly Gly Leu Arg Ser
                      430                      435                      440

TGT GTA GGC AAA GAG TTT GCA AAA ATT CTT CTT AAG ATA TTT ACA GTG      1395
Cys Val Gly Lys Glu Phe Ala Lys Ile Leu Leu Lys Ile Phe Thr Val
                      445                      450                      455

GAG CTG GCT AGG CAC TGT GAT TGG CAG CTT CTA AAT GGA CCT CCT ACA      1443
Glu Leu Ala Arg His Cys Asp Trp Gln Leu Leu Asn Gly Pro Pro Thr
                      460                      465                      470

ATG AAG ACA AGC CCC ACT GTG TAC CCT GTG GAC AAT CTC CCT GCA AGA      1491
Met Lys Thr Ser Pro Thr Val Tyr Pro Val Asp Asn Leu Pro Ala Arg
                      475                      480                      485

TTC ACC TAC TTC CAG GGA GAT ATC TGATAGCTAT TTCAATTCTT      1535
Phe Thr Tyr Phe Gln Gly Asp Ile
490                      495

GGACTTATTT GAAGTGATA TTGGTTTTTT TAAAAATAG TGTCATGTTG ACTTTATTTA      1595

ATTTCTAAAT GTATAGTATG ATATTTATGT GTCTCTACTA CAGTCCCGTG GTCTTTAAAT      1655

ATTAAATAAA TGAATTTGTA TGATTTCCCA ATAAAGTAAA ATTAAAAAGT GAAAAAAAAA      1715
AAAAAAAAAA      1725

```

## (2) INFORMATION FOR SEQ ID NO:32

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 497 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32

```

Met Gly Leu Pro Ala Leu Leu Ala Ser Ala Leu Cys Thr Phe Val Leu
 1                      5                      10                      15

Pro Leu Leu Leu Phe Leu Ala Ala Leu Lys Leu Trp Asp Leu Tyr Cys
20                      25                      30

Val Ser Ser Arg Asp Arg Ser Cys Ala Leu Pro Leu Pro Pro Gly Thr
35                      40                      45

Met Gly Phe Pro Phe Phe Gly Glu Thr Leu Gln Met Val Leu Gln Arg
50                      55                      60

Arg Lys Phe Leu Gln Met Lys Arg Arg Lys Tyr Gly Phe Ile Tyr Lys
65                      70                      75                      80

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- 20/28 -

Thr His Leu Phe Gly Arg Pro Thr Val Arg Val Met Gly Ala Asp Asn  
 85 90 95  
 Val Arg Arg Ile Leu Leu Gly Glu His Arg Leu Val Ser Val His Trp  
 100 105 110  
 Pro Ala Ser Val Arg Thr Ile Leu Gly Ala Gly Cys Leu Ser Asn Leu  
 115 120 125  
 His Asp Ser Ser His Lys Gln Arg Lys Lys Val Ile Met Gln Ala Phe  
 130 135 140  
 Ser Arg Glu Ala Leu Gln Cys Tyr Val Leu Val Ile Ala Glu Glu Val  
 145 150 155 160  
 Ser Ser Cys Leu Glu Gln Trp Leu Ser Cys Gly Glu Arg Gly Leu Leu  
 165 170 175  
 Val Tyr Pro Glu Val Lys Arg Leu Met Phe Arg Ile Ala Met Arg Ile  
 180 185 190  
 Leu Leu Gly Cys Glu Pro Gly Pro Ala Gly Gly Gly Glu Asp Glu Gln  
 195 200 205  
 Gln Leu Val Glu Ala Phe Glu Glu Met Thr Arg Asn Leu Phe Ser Leu  
 210 215 220  
 Pro Ile Asp Val Pro Phe Ser Gly Leu Tyr Arg Gly Val Lys Ala Arg  
 225 230 235 240  
 Asn Leu Ile His Ala Arg Ile Glu Glu Asn Ile Arg Ala Lys Ile Arg  
 245 250 255  
 Arg Leu Gln Ala Thr Glu Pro Asp Gly Gly Cys Lys Asp Ala Leu Gln  
 260 265 270  
 Leu Leu Ile Glu His Ser Trp Glu Arg Gly Glu Arg Leu Asp Met Gln  
 275 280 285  
 Ala Leu Lys Gln Ser Ser Thr Glu Leu Leu Phe Gly Gly His Glu Thr  
 290 295 300  
 Thr Ala Ser Ala Ala Thr Ser Leu Ile Thr Tyr Leu Gly Leu Tyr Pro  
 305 310 315 320  
 His Val Leu Gln Lys Val Arg Glu Glu Ile Lys Ser Lys Gly Leu Leu  
 325 330 335  
 Cys Lys Ser Asn Gln Asp Asn Lys Leu Asp Met Glu Thr Leu Glu Gln  
 340 345 350  
 Leu Lys Tyr Ile Gly Cys Val Ile Lys Glu Thr Leu Arg Leu Asn Pro  
 355 360 365  
 Pro Val Pro Gly Gly Phe Arg Val Ala Leu Lys Thr Phe Glu Leu Asn  
 370 375 380

- 21/28 -

Gly Tyr Gln Ile Pro Lys Gly Trp Asn Val Ile Tyr Ser Ile Cys Asp  
385 390 395 400

Thr His Asp Val Ala Asp Ile Phe Thr Asn Lys Glu Glu Phe Asn Pro  
405 410 415

Asp Arg Phe Ile Val Pro His Pro Glu Asp Ala Ser Arg Phe Ser Phe  
420 425 430

Ile Pro Phe Gly Gly Gly Leu Arg Ser Cys Val Gly Lys Glu Phe Ala  
435 440 445

Lys Ile Leu Leu Lys Ile Phe Thr Val Glu Leu Ala Arg His Cys Asp  
450 455 460

Trp Gln Leu Leu Asn Gly Pro Pro Thr Met Lys Thr Ser Pro Thr Val  
465 470 475 480

Tyr Pro Val Asp Asn Leu Pro Ala Arg Phe Thr Tyr Phe Gln Gly Asp  
485 490 495

Ile

(2) INFORMATION FOR SEQ ID NO:33

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 273 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33

CGCACCCAG GAGGCGCGCT CGGAGGGAAG CCGCCACCGC CGCCGCCTCT GCCTCGGCGC	60
GGAACAAACG GTTAAAGATT TTGGGCCASC GCCTCCGCGG GGGGAGGAGC CAGGGGCCCC	120
AATCCCGCAA TTAAAGATGA ACTTTGGGTG AACTAATTGT CTGACCAAGG TAACGTGGGC	180
AGCAACCTGG GCCGCCTATA AAGCGGCAGC GCCGTGGGGT TTGAAGCGCT GCGGCGGGCG	240
GCAGGTGGCG CGGGAGGTGG CGGCGCGCCA TGG	273

(2) INFORMATION FOR SEQ ID NO:34

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 274 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34

CGCACCCCA GGAGGCGCGC TCAGAGGGA GCGCCAGTG CGCCGCCTCT GCCTCGGCGC	60
GGAACAAACG GTTAAAGATT TTTTGGGCA GCGCCTCGAG GGGGAGGAG CCAGGGGCC	120

- 22/28 -

GATCCGCAAT TAAAGATGAA CTTTGGGTGA ACTAATTTGT CTGACCAAGG TAACGTGGGC	180
AGTAACCTGG GCGGCCTTAT AAAGAGGGCG CGCGGCGGGG TTCGGAGCTA GGGAGGCGGC	240
GGCAGGTGGC GCGGGAGGCT GAAGCGTGCC ATGG	274

## (2) INFORMATION FOR SEQ ID NO:35

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 319 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35

TCGGGGGAAT TAACACCTTT TCAAAGTGAA ATCTCAGGAT TGTCTGCCTT CTACAGGAGG	60
TGGTATTAAA ATGCGCCTAT AACAAATGGT TGAGAGTTTG GAGCCGCTTC TGCCCTGTGG	120
GCGGGGCGAG ATGACACCAC AATTAAAGAT GAACTTTGGG TGAATAATT TATCTGAGGA	180
AGTTAACAGG AGGAGACCTG CGCGCAATGG ATATATAAGG GCGCGCAGGC GAGGACGCCC	240
TCAATTTGTG CGTAAAGACG CGTCTCCTCT CCAGAAGCTT GTTTTTCGTT TTGGCGATCA	300
GTTGCGCGCT TCAACATGG	319

## (2) INFORMATION FOR SEQ ID NO:36

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2677 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:36

GATCCAGAT CTGCCTATTG CGCCCGATGC CCCGAGGCTC TCTCTTGGAC TCTGGCCCTG	60
AGTTCTTCTG CGGATCCTT CGGAGACGTC TGGAGGCCTG CTTTATGCAT CTCTCTTGGA	120
CCTCAGTTTC CCCACACGTG GGAGGAGGCA GCTGGACGAT TCCTGAAAGG ACTTTCCTT	180
GCTTCCTCAT CACGTGGAAG AGAGCCCACC CGGCACCTGG AAATGGAAAG CCAGTGAAGG	240
CTGCTTTGGG CCGGGGCAKC GGGTGGGACC GGGCGGGAGG GATTCCAAAG AGACCGCCGG	300
GAAGGCTAGA GCTTGGAATT CCGGCTCCTC GGAGTCCTGG CCCTCCCCCA CCGCCGCTC	360
GGAGCTCAGC ACACCTTGGA TGGGGGAGGC GGGCAGCTCC TAGCCCCGCA CCCCAGGAGG	420
CGCGCTCGGA GGAAGCCGC CACCGCCGCC GCCTCTGCCT CGGCGCGGAA CAAACGGTTA	480
AAGATTTTGG GCCASCGCT CCGCGGGGGG AGGAGCCAGG GGCCCCAATC CCGCAATTAA	540
AGATGAACTT TGGGTGAACT AATTGTCTGA CCAAGGTAAC GTGGGCAGCA ACCTGGGCCG	600

- 23/28 -

CCTATAAAGC GGCAGCGCCG TGGGGTTTGA AGCGCTGGCG GCGGCGGCAG GTGGCGCGGG	660
AGGTGCGGGC GCGCCATGGG GCTCCCGGCG CTGCTGGCCA GTGCGCTCTG CACCTTCGTG	720
CTGCGCGTGC TGCTCTTCCT GGCTGCGATC AAGCTCTGGG ACCTGTACTG CGTGAGCGGC	780
CGCGACCGCA GTTGTGCCCT CCCATTGCCC CCCGGGACTA TSGGSTTCCC CTTCTTTGGG	840
GAAACCTTGC AGATGNTACT NCAGSTAAGG GAGGGTGGGG CGGGACAGGC TGCTTCCCCG	900
GAGCCCGGCG CGGCTCTGGG CTTCTGCTGA AGTCGGGGTA GCGCCCCCG GGAGGCATGC	960
TATTGCGGCT AGGAGCAGGG CTGGCGGGAG CGCGGCGCTC CCCGGMKMYC SCTCAWGCSC	1020
RCWWKTMWCC TCCGCCTYMC TCCCAMAGCG GARSAARWKC YKMRGATGA AGCGCAGGAA	1080
ATACGGCTTC ATCTACAAGA CGCATCTGTT CGGGCGGCC ACCGTACGGG TGATGGGCGC	1140
GGACAATGTG CGGCGCATCT TGCTCGGAGA GCACCGGCTG GTGTCGGTCC ACTGGCCAGC	1200
GTCGGTGCGC ACCATTCTGG GATCTGGCTG CCTCTCTAAC CTGCACGACT CCTCGCACAA	1260
GCAGCGCAAG AAGGTGGGGG CAGGAGGCGA CGGCTGGACA GGGAGGGGGA CCCCATTTAT	1320
GAGCGGAATT CCGGCTGATG GATGCTAGGC GCGGGCTAGC AGCTTGAGGT GGGCTAGGAC	1380
CCTCTGCCAG CTCCAGGTTA GCTTTCCAG CTGCGAGAGT GCCATGTGTC TGGCAGGACT	1440
GGGGGTGTCT GGAAGGGGAC GCGGGTAGAC GAGAGGGGCG GATGGAGGCT TTTAACGCTG	1500
TCCCCCTCTC GGGACTCAGG TGATTATGCG GGCCTTCAGC CGCGAGGCAC TCGAATGCTA	1560
CGTGCCGGTG ATCACCAGAGG AAGTGGGCG CAGCCTGGAG CAGTGGCTGA GCTGCGGCGA	1620
GCGCGGCCTC CTGGTCTACC CCGAGGTGAA GCGCCTCATG TTCCGAATCG CCATGCGCAT	1680
CCTACTGGGC TGCGAACCCC AACTGGCGGG CGACGGGGAC TCCGAGCAGC AGCTTG TGGA	1740
GGCCTTCGAG GAAATGACCC GCAATCTCTT CTCGCTGCCC ATCGACGTGC CCTTCAGCGG	1800
GCTGTACCGG GTAAGGGCGG CAAACGGGCT GCGGACTAGG GCGCGGGGAC CTGGGCGTCT	1860
GCTCACCGCC GCGCGCTCTC TGCGCTCAGG GCATGAAGGC GCGGAACCTC ATTCACGCGC	1920
GCATCGAGCA GAACATTGCG GCCAAGATCT GCGGGCTGCG GGCATCCGAG GCGGGCCAGG	1980
GCTGCAAAGA CGCGCTGCAG CTGTTGATCG AGCACTCGTG GGAGAGGGGA GAGCGGCTGG	2040
ACATGCAGGT GAGTAGCAGC TTCAGACCAG GCACTGCGGA GTTTGGTCCC CTGGCTTTCC	2100
AAGGCGCTGT TCCTGGGGCC CCCAAAGCGC GCGCCTGGGG CCCAGCTTTC TGGAGTGGGC	2160
GGCCGGCTCA GACTACAGCT ATGGAATCCC GAAGGAAGGC TGAGACACCC GGTCAGGAGA	2220
GCTGCGGAAG GGGCTGCGGM GGAACTGGG AGCATCCCCT AGCCTTTAMC AGGTTTCAAA	2280

- 24/28 -

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GGGAAAGTTG GAATTTGCAA AAATGTTAAT AAAGAACCTT GCGATTTTAA TAAACTAAG      2340
ACTTTAACTC AGGAGTTTCC GGTAGRGCGG GGTCTACTC GCCTTACTGC TCCAGCTGAA      2400
CTAAAGGGAC GTTGCAATTT GTTTAAAGAT ATTGCTTTCC TTGACTTTCT GTCAGCAAAA      2460
CATTTAGCCC TTCTAGTCTT CCCTCCAGAA CTCTCAGTTC GATTCTGAGT AATCCTTCTG      2520
TCAAACCGCA GGCAGACTTG TGAGAATGTG GGTCTCACTC TATCTTAGG CACTAAAGCA      2580
ATCTTCAACC GAACTCCTCT TTGGAGGACA CGAAACCACG GCCAGTGCAG CCACATCTCT      2640
GATCACTTAC CTGGGGCTCT ACCCACATGT TCTCCAG      2677

```

## (2) INFORMATION FOR SEQ ID NO:37

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 683 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37

```

GATCCAGGTT GCTGAAACAT ATCTCCATAT AGGGCAGAAC AATTATCAAA AGCATAAGAA      60
TTGCAGCCAC AGCATAGGGA AGAAAGAGGA GTTTTAAAC CACAACAAA GGGAGAAAGA      120
AGAGAATTTT AACTTACATT TAATTCAAAA GTCTTCAGAG CAACCCGAAA CCCTCCTGGA      180
ACTGGGGGAT TCAGTCGAAG GGTCTCCTTA ATAACACACC CGATGTATYT AAGTTGTTCC      240
AAAATTTCCA TGTCCAACCT GTTGTCTTGA TTGCTCTTGC AAAGTAAACC CTAYCAAAAY      300
AGTCATACAG AGGTGAACAG TYATTTTGTG CTCCAAATAA AATCAGCCCA GCAGACGTAA      360
ACAGGGCTTA AGTGGAGACT AAACCCAAAG GGCCCCATGA TGGGAGAGAC TGGGAGGGGG      420
AACAGCAGC TAATGGCCAT TTGCCTGCCC AAATCCACTA TCTATTTACA ATCCAGGAG      480
AATGCTGCTC ACCAGTTAGA AGGACCAAGT TTCTCCCCAC GCCCCCCCAC CCCACACTCA      540
CCACCACCAC CCACACTAAT CAGCTATTCA CACTATGTAT GCCCTTGGAC ACACCAATTC      600
AAGAAAAGTG GAACCTATCT GAGAATCTCC ACGGTTCAAA AAAAGGTGGA GGAGGGGTAG      660
GAATACAAGG TCAAACCCTG CCC      683

```

## (2) INFORMATION FOR SEQ ID NO:38

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4164 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

- 25/28 -

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38

TCGCGAGGAG CGACCACGGC TTGAAGAGGG GTAGACGAGA CCAGATGCTC CCCGGCGCCC	60
CCTCATGCGG GTTGCGGTCT CTCTCCTCCA CCTCCCTCTC AGCGGAGGAA GTTTCTGCAG	120
ATGAAGCGCA GGAAATACGG CTTTCTCTAC AAGACGCATC TGTTTGGGCG GCCCACGGTG	180
CGGGTGATGG GCGCGGATAA TGTGCGGCGC ATCTTGCTGG GAGAGCACCG GTTGGTGTGG	240
GTGCACTGGC CCGCGTCGGT GCGCACCATC CTGGGCGCTG GCTGCCTCTC CAACCTGCAC	300
GATTCCTCGC ACAAGCAGCG AAAGAAGGTG AGGGTGAGCT GGCAACTCCT TGGCTGGCAG	360
GGAGACCTCA TCCTATGGCT TGGTTCAGGC AAAATAGAAT GCGGGGCGAG GGCTAGTCCT	420
ATGTGGTGGG GACCAGGACC CTCTCTATCT GAGATCCACT TTAGCTTTTC TGCTAGCACG	480
TGGGTTAGTC CTGGGGGGGA CTGAAATTCT TGAAAGGGTA CTCGGAAAGG CGAAGGGGGG	540
GGGGCTGAGG GAAAGTAGAG GATTGTAACA CTCTCTGCTC CTGGGGGGTG CTCAGGTGAT	600
TATGCAGGCC TTCAGCCGCG AGGCACTCCA GTGCTACGTG CCGTGATCG CTGAGGAAGT	660
CAGCAGTTGT CTGGAGCAGT GGCTAAGCTG CCGCGAGCGC GGCTCCTGG TCTACCCCGA	720
GGTGAAGCGC CTCATGTTCC GCATCGCCAT GCGCATCCTG CTGGGCTGCG AGCCGGGTCC	780
AGCGGGCGGC GGGGAGGACG AGCAGCAGCT CGTGGAGGCT TTCGAGGAGA TGACCCGCAA	840
TCTCTTCTCT CTTCOCATTG ACGTGCCCTT TAGCGGCCCTG TACCGGGTAA GGGCGGTTTG	900
CGGAGTCGGA GTAGGGGAAC GCAAGCTCGG GCATCCGCTC ACCGCCACGC TCTCTCCGCG	960
CTCAGGGCGT GAAGGCGCGG AACCTTATAC ACGCGCGCAT CGAGGAGAAC ATTGCGGCCA	1020
AGATCCGCCG GCTTCAGGCT ACAGAGCCGG ATGGGGGTTG CAAGGACGCG CTGCAGCTCC	1080
TGATTGAGCA CTCGTGGGAG AGGGGAGAGA GGCTGGATAT GCAGGTGAGA AGCAATTTCA	1140
AAAGGTGCCA AGGGCCGGGG AGTGCCTCTG ACTTTCCAGA CACACTTTCT GGGGTCTCCA	1200
AAGCCCTGTC AAGGCCCCAG CTACTTCCAA GTGGGCGGCG ATGCTAGGTC TAGAGCTTTT	1260
CAACCTGTGG GTCGTGACCC CTTACGGAG CCAAACAACC CTTTCAGAAG GGTGCGCTAA	1320
GAGCATCTGC ATATCCGATA TTTACATCAA GAAACATAAC AGTAGCAAAA TTACCGTTAT	1380
GAAGTAGCAA CAAAGATAAT TTTATCGTTG GGGGTCACCA CAACACGAGG AACCGTATTA	1440
AAGGGTGGCA TTGGTCTAGA GAGCTGTGGA AGGGGGTGGC TGAGCAATGG GGAAGATCCC	1500
AAAGTTCAAA GGGCAAGGCT CATCTACAAA GGTAAAGCG GAAGAGCAGG ATTAAGGGAG	1560
TTTTGCGTTT TTGTTTGTGG TCTTGACTT TCTATGAACA AAACGGATTT TACCCTTGAA	1620
GTCTTCCGTG CAATATTCTC AGGTCAGGTC TTTGTAACAG TGCTATAAAC TGCACTCAGA	1680

- 26/28 -

TCTGTATAAA CTTCCGTTTT TATCCTTAGG CACTAAAACA ATCGTCAACA GAGCTCCTCT	1740
TTGGTGGTCA TGAAACTACA GCCAGTGCTG CGACGTCAC TATCACTTAC CTAGGACTCT	1800
ACCCACATGT CCTCCAGAAA GTTCGAGAAG AGATAAAGAG CAAGGTAGGA TGATTCTAGA	1860
GGTCCCCAT TTGCCTAGGA CATTCTCTA TTAACCACCA CCACCACCCC CACTGTATAT	1920
AAGTTTGCTC GATACACCCA GTACTATGAC AGTGAAGATC TGAGAGCTAG GTGGGACTGT	1980
GGGGGAGAGA CTCCACCTCG TGAATTTAAA AAGGCAGTTG TTTGTACTGG GCTCTCTCTT	2040
GGGCAGAATT TGACCTCTC CTCCTCCTCC TCCTCCTCCT CCTCTTCCTC CTCCACCACC	2100
ACCACCATCA CCACCTTTTA TAGAGCAAGG TTCTCCTTTC CCTGACCAAG AACATGAATA	2160
ATGTGATTAG AGCCAATAGC TGATCAGGGT CGCAGTGTTG GTGAGGGCTC AGGGTATGAC	2220
CCTTTATATA CTTGATAAGC AACATTGTCT GGATAATGGG TTTAGGCTGA GGAAGTGTGG	2280
AAAGGAAGGC CATCAGGCCA TCAGCTCTTT CCCTTTTATC CTCTCCCATC CAGACGCCTT	2340
CAGGTTTAGT TAACAGGTGA GTCCTGCTGG GCTGACTTTT TTTTGGAGT GCCCAGGGAT	2400
CCATCACTCA CTTTTTTATC TGTTTCCATA GGGCTTACTT TGCAAGAGCA ATCAAGACAA	2460
CAAGTTAGAC ATGGAAACTT TGGCACAGCT TAAATACACT GGGTGTGTCA TTAAGGAGAC	2520
CCTGCGATTG AATCCTCCGG TTCCAGGAGG GTTTCGGGTT GCTCTGAAGA CTTTGTAGCT	2580
GAATGTGAGT GCACCTCCTG TCCCCACCC CCAGCCCTCG TCCACGTCCA CTCTGCTATG	2640
CTGTTGAGCA TCAGCTGCCC AGAGCAGTGG CTCACTGCCC TTGACAGTGT CCTGCCTCCT	2700
ATGGTACTGG GAACCAATTT GCTCTCCTCT CTTAATGCCA TCCATGCTAG TAATGACTTT	2760
TTGTTGTTGC AAGCTCAGGG CCGGGATTGT CAATTCCTAG GATTTTTTTT TTTTTTTAAA	2820
CAGGGATACC AGATCCCCAA GGGCTGGAAT GTTATTTACA GTATCTGTGA CACCCACGAT	2880
GTGGCAGATA TCTTCACTAA CAAGGAGGAA TTTAATCCCG ACCGCTTTAT AGTGCCTCAT	2940
CCAGAGGATG CTTCCCGGTT CAGCTTCATT CCATTTGGAG GAGGCCTTCG GAGCTGTGTA	3000
GGCAAAGAGT TTGCAAAAAT TCTTCTTAAG ATATTTACAG TGGAGCTGGC TAGGCACTGT	3060
GATTGGCAGC TTCTAAATGG ACCTCCTACA ATGAAGACAA GCCCCACTGT GTACCCTGTG	3120
GACAATCTCC CTGCAAGATT TACCCACTTC CAGGGAGATA TCTGATAGCT ATTTCAATTC	3180
TTGGACTTAT TTGAAGTGTA TATTGTTTTT TTTAAATAG TGTCATGTTG ACTTTATTTA	3240
ATTTCTAAAT GTATAGTATG ATATTTATGT GTCTCTACTA CAGTCCCGTG GTCTTAAATA	3300
TTAAATAAAT GAATTTGTAT GATTTCCCAA TAAAGTAAAA TAAAAAGTG CTTCTCTTGC	3360

- 27/28 -

TTTTTAAGAT TCTTGTGGC AAGCTGCCCA TGGTGGTACA TTGCTGTAAT ACTAGGACTT	3420
GGAAGGTGGA GGCAAGAAGA GCAGGCATTC AAGGCTAGCC TGGGCTACAG AAATCCTGTC	3480
TTAAACAAAC ACTACAACAA AAAGTCCTGT TAGGGAATCT GACTGGCTCA GTGTTTGATC	3540
TTTGTGTATT TAAAATGATT TAGAGTGAAA CCATAGGTCT CTCCCCATG TCAGAAAATA	3600
TATATTATTA TGTGTATGCT GATCCAAAGT ATCTTTGTAA CTTTTTCTAA GGTCATTGAG	3660
ACTTCATATT TTGAAATTGT ATGGAGGCTA GTTATATTAC ATTATTTATT TATTTATTTA	3720
TTTACATTTT TATGGTGCTG GGGATTGGAT CGAAGGCTTC ACACCTCTAG GGCAAGCCCT	3780
TTGTCATTAA GGCCTGCCT CTCCCTTCA GCCCAACGTT AATTCTAGAT TCTTTTTCTT	3840
TGGTGCTTTT GGGAGGTAAA CCTGGGATGC TGCAGTTATT TGGTGGTGGT CGTTGGTTTT	3900
ACTCTAGAGA GAAGGCAACT TTGGGAAGGC AACACTGCTG CTGGTGAGTC GGGAAGCATC	3960
ATCCAGAGC AACGGGGTCA GCATAGCTAA CATTTTAAAT CAGCATAATG AATCCCTGTC	4020
ATATGGAGGA GGCAGAACTC CTCTTTGAAG TTGATATTTT AGATAAGACA GAGCCAGCCC	4080
CTCTGCTTAT GGACAGTTCT TACCCAAAAT GAAACAGAGA AGAAAACCAC TGGTGTGTCA	4140
CCTTTCCTTA GAAGTGCTTC AGGA	4164

## (2) INFORMATION FOR SEQ ID NO:39

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ix) FEATURE:

- (D) OTHER INFORMATION: Each N can represent any nucleotide  
and there can be 0 to 5 N

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:39

TGAACTNNNN NTGAACT

17

## (2) INFORMATION FOR SEQ ID NO:40

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:40

TCTGASSAAG KTAAC

15

- 28/28 -

- (2) INFORMATION FOR SEQ ID NO:41  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41

CAATTAAAGA

10

- (2) INFORMATION FOR SEQ ID NO:42  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 31 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42

CAATTAAAGA TGAAC TTTGG GTGA ACTAAT T

31

- (2) INFORMATION FOR SEQ ID NO:43  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 15 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43

GTAGCACGGA TGGTG

15